



SURGICAL REMOVAL OF NASOPALATINE DUCT CYST WITH RETROGRADE ROOT CANAL FILLING WITH MINERAL TRIOXIDE AGGREGATE (MTA) – A CASE REPORT AND REVIEW OF LITERATURE

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Article Received on 21/03/2018

Article Revised on 12/04/2018

Article Accepted on 02/05/2018

ABSTRACT

The nasopalatine duct cyst is the most common non-odontogenic developmental cysts. Nasopalatine duct cyst also termed as incisive canal cyst arises from embryologic remnants of nasopalatine duct. Most of these cysts develop in the midline of anterior maxilla near the incisive foramen. This article reports a case and review of literature with respect to epidemiology, etiology, clinical presentation, radiographic and pathological findings, and treatment and recurrence rates.

KEYWORDS: Nasopalatine duct cyst, Non-odontogenic cyst, Incisive canal cyst and Median palatine cyst.

INTRODUCTION

The nasopalatine ducts communicates with the nasal cavity in the anterior region of the maxilla. It is located on the palatal aspect in midline of maxilla; above the retro incisor palatal papilla. During fetal development the ducts gradually narrow until 1 or 2 central clefts are finally formed on the midline of the upper maxilla. The nasopalatine neurovascular bundle is located within the duct, and emerges from its intrabony trajectory through the nasopalatine foramen. There can be as many as six different foramina, though there are usually only two, with independent neurovascular bundles (right and left) the vascular and neural elements can emerge separately; in this sense, foramina containing exclusively vascular elements are known as Scarpa's Foramina.

The nasopalatine duct cyst (NPDC) was first described by Meyer in 1914^[2]. It is also known by other names such as anterior midline cyst, maxillary midline cyst, anterior middle palatine cyst, and incisive duct cyst were regarded as fissural cyst in the past³. At present according to the classification of the World Health Organization (WHO) it is regarded as developmental, epithelial, non-odontogenic cysts of the maxilla along with nasolabial cysts. It is considered to be the most common of the non-odontogenic cysts, occurring in about 1% of the population. The majority of cases occur between 4th and 6th decade of life. It is slightly more common in males than in females. These cysts are

usually asymptomatic. On occasion, they may present as soft tissue mass.^[1]

CASE REPORT

The case presented here is that of a 29 year old man with an extra oral massive swelling in the anterior part of the right zygoma for past 1 month. The swelling gradually increased to the present size. There was slight rise in surface temperature in the affected site with difficulty in mastication and pain while opening mouth.

Intra oral examination revealed a well-defined swelling approximately 40 mm × 50 mm located over the right zygomatic arch (figure 1) extending till the posterior maxillary buttress. On palpation the swelling was fluctuant and tender. Occlusal radiograph showed well circumscribed oval shaped radiolucency in the anterior maxilla between the roots of central incisors extending till the roots of canine with two tooth – like structure impacted deep above the canine and pre – molar teeth. No evidence of resorption of the tooth roots. An incisional biopsy was done under local anesthesia and sent for histopathological examination fixed in 10% formalin. There was blackish – yellow discharge from the sinus cavity following the incisional biopsy. On the histopathological examination and radiological examination, a provisional diagnosis of Nasopalatine duct cyst was confirmed.

Due to the extensive distribution of the lesion covering the whole of the right maxillary sinus, the lesion was excised completely under general anesthesia. Crevicular incision with papillae preservation was placed on the anterior maxilla (figure 2) till the last maxillary molar, mucoperiosteum was elevated, buccal bone was resorbed in most of the part. Complete cystic enucleation was done (figure 3), followed by mid – surgical obturation of 11,21,14,15 and 16 with gutta – percha (figure 5) and retrograde root canal filling with Mineral Trioxide Aggregate (MTA) (figure 6). There was no cystic lining present. Two tooth – like structure (figure 4) was removed from the palate via mid crevicular incision through palatal approach. Through wound debridement was done using metronidazole solution, betadine and saline solution. Wound closure was done with (3-0) vicryl suture (figure 7).



Figure 1: extraoral swelling over right cheek.



Figure 2: Crevicular Incision Placed.



Figure 3: Complete Removal Of Cystic Content.



Figure 4: Cystic Contents Along With Impacted tooth – like structures.



Figure 5: Mid – Surgical Obturation Done With Gutta Percha.



Figure 6: Retrograde Filling With MTA.



Figure 7: Wound Closure With Vicryl (3-0).

HISTOPATHOLOGICAL EXAMINATION

Microscopic examination revealed fibrous wall lined by pseudostratified ciliated columnar epithelium and partly by stratified squamous epithelium. Few nerve bundles, blood vessels and mucous cells were seen in the cyst wall.

DISCUSSION

The Nasopalatine Duct Cyst (NPDC) is the most common developmental, non-neoplastic, non-odontogenic cysts of the oral cavity, occurring in about 1% of population¹. They are believed to develop from remnants of paired embryonic nasopalatine ducts³. Nasopalatine Duct Cyst is one of the many pathologic processes that may occur within the jaw bones, but is unique in that it develops in only a single location, which is the midline of the anterior maxilla.⁴ It can arise at any age, but is seen most often in patients between 30 and 60 years of age^{2,5} though there have been reports of NPDC in pediatric patients up to 8 years of age¹. It is slightly more common in males than in females; the ratio being 3:1 which could be because women typically seek dental help sooner than men². Due to a lack of representative studies, it is not fully clear whether NPDC are more common in Caucasians, Negroes or Asians.⁶

Nasopalatine ducts ordinarily undergoes progressive degeneration however, the persistence of the epithelial remnants may later become the source of epithelia that gives rise to NPDC, from either spontaneous proliferation⁷ or proliferation following trauma (e.g. removable dentures), bacterial infection or mucous retention.⁶ Genetic factors have also been suggested.^{1,5} The mucous glands present among the proliferating epithelium can contribute to secondary cyst formation by secreting mucin within the enclosed structure⁸. The etiology is not clear, though in addition to the hypothesis of spontaneous proliferation from embryonic tissue remains. However few authors consider an unknown etiology or spontaneous proliferation to be the most plausible explanation, based on studies reporting cystic degeneration phenomena in the incisal duct and on the midline of the palate in human fetuses, in which the

above mentioned circumstances are unable to have occurred.^[1]

There have even been exceptional reports such as the casual diagnosis of NPDC 9 months after rapid surgical palatal expansion or NPDC associated to the presence of two bilateral mesiodens^[1]. NPDC can form within the incisive canal which is located in the palatine bone and behind the alveolar process of the maxillary central incisors, or in the soft tissue of the palate that overlies the foramen, called the cyst of the incisive papilla^[5].

These cysts are usually asymptomatic and discovered on routine radiographs. The most common presenting symptoms are swelling of the anterior palate, drainage and pain. Rarely a large cyst may produce a “through-and-through” fluctuant expansion involving the anterior palate and labial mucosa. If the cyst is near the surface, the swelling will be fluctuant with a bluish hue. Deeper cysts are covered by normal mucosa, unless it is ulcerated. Burning sensation and numbness may be experienced due to pressure on the nasopalatine nerve. Occasionally they cause intermittent discharge with a salty taste. Displacement of teeth is a rare finding.^[1]

Radiographically it appears as a round or ovoid radiolucency between the roots of the central incisors. Due to superimposition of the nasal spine, a heart shaped appearance may be seen. Most of the lesions have a well-defined sclerotic border.^[1,5] In some individuals, a prominent incisive canal can appear as a radiolucent area and mimic NPDC. Most authors agree that 6 mm should be considered the upper limit for normal incisive canal radiolucencies larger than this should be considered potentially pathologic and merit further investigation.^[1]

The differential diagnosis should be established with the following conditions:

Odontogenic cysts (e.g., lateral radicular cyst, lateral periodontal cyst, odontogenickeratocyst).
Odontogenictumours (e.g., ameloblastoma, odontogenicmyxoma).

Non-odontogenictumours (e.g., central giant tumor, brown tumor of hyperparathyroidism, central haemangioma)^[1] Histopathological examination reveals a cavity lined by epithelium and surrounded by connective tissue wall. A reported 71.8% of NPDCs have squamous, columnar, cuboidal or some combination of these epithelial types; respiratory epithelium is seen in 9.8%⁵. The type of epithelia that line the nasopalatine duct is highly variable, depending upon the relative proximity of the nasal and oral cavities. The most superior part of the duct is characterized by a respiratory type of epithelial lining and moving downwards the lining changes to cuboidal epithelium. In the most inferior portion closest to the oral cavity, squamous epithelium is the usual type.^[1]

The treatment of choice is surgical excision of the cyst, although some authors propose marsupialization of large cysts. The neurovascular bundle is a delicate and highly vascularized structure giving rise to profuse bleeding if inadvertently sectioned during surgery. Electrocoagulation is required in such cases.

CONCLUSION

NPDC occurs in approximately 1% of the population. Presentation may be asymptomatic or include swelling, pain and drainage from the hard palate. A well circumscribed, round, ovoid or heart shaped radiolucency is seen on radiograph. Histopathological findings reveal squamous or respiratory cell types, or a combination of these, infiltrated by inflammatory cells. Enucleation is the preferred treatment with low recurrence rate.

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